

REMARKS

Claims 1 to 26 appear in this application for the Examiner's review and consideration. Claims 1, 5, 15, and 20 have been amended and are fully supported by the specification and claims as originally filed. In particular, support for the claims can be found in, *inter alia*, Figures 4, 6, 7, 13, 15, paragraph 34, and Examples 1 and 2 of the specification. Therefore, there is no issue of new matter. In addition, the amendments to the independent claims add recitations that elaborate on the structure of the presently claimed invention, and, thus, do not affect the scope of the claims. The amendments only further clarify the claimed invention.

Claims 1-26 were rejected under 35 U.S.C. § 112, first paragraph, for the reasons set forth on pages 2 and 3 of the Office Action. In particular, the Office Action states that the specification does not explain the genesis of the perturbations within the electric field, and that applicant's examples utilize a three-electrode system that do not show the motion of charged molecules with only two electrodes.

In response, Applicants submit that the claims have been amended to recite "a first electrode and a second electrode" capable of generating a first electric field in the sample chamber, and a "third electrode capable of generating a second electric field" in a fluid reservoir.

Moreover, 35 U.S.C. § 112, first paragraph requires only that the specification describe how to make and use the invention; it does not require explanation of the mechanism through which the invention operates. "As long as the specification discloses at least one method for making and using the claimed invention that bears a reasonable correlation to the entire scope of the claim, then the enablement requirement of 35 U.S.C. 112 is satisfied." MPEP § 2164.01(b); *In re Fisher*, 427 F.2d 833, 839 (CCPA 1970). Therefore, a specific explanation in the specification of the genesis of the perturbations within the electric field is not required. All that is required is a description that enables one of ordinary skill in the art to make and use the invention.

In addition, Examples 1 and 2 provide integrated microfluidic devices where two electrodes in the sample chamber generate an electric field configured to transfer charged molecules in the sample chamber to the microfluidic channel, where a third electrode is present in the fluid reservoir. Additional examples of configuring the two electrodes to transfer charged molecules to the microfluidic channel connect to a fluid reservoir, comprising a third electrode, are illustrated in, for example, Figures 4, 6, 7, 13, 15, which are further described in paragraphs 19, 21, 22, 24, 28, and 30 of the specification. With such

illustrations and further elaboration in the specification, one of ordinary skill in the art would have been able to make and use the presently claimed invention. Because the specification discloses at least one method for making and using the claimed invention, Applicants respectfully submit that the enablement requirement has been satisfied. *See* MPEP § 2164.01(b).

Therefore, as the specification contains a description of the invention and of the manner and process of making and using the invention that enables one of ordinary skill in the art to make and use this invention, the specification and claims meet the requirements of 35 U.S.C. § 112, first paragraph. Accordingly, it is respectfully requested that rejection of the claims under 35 U.S.C. § 112, first paragraph be withdrawn.

Claims 1-26 were rejected under 35 U.S.C. § 112, second paragraph, for the reason set forth on pages 3 and 4 of the Office Action. In particular, the Office Action states:

Claims 1 through 26 require two electrodes capable of generating an electric field in the sample chamber and configuration of the electric field to transfer charged molecules to the inlet or from the outlet of a microfluidic channel. It is unclear how this configuration of the field can accomplish this motion, as the fields shown in applicant's figures 9 through 12 do not follow the typical parallel field configuration for two plate electrodes.

In response, Applicants submit that the claims, as amended, recite “a first electrode and a second electrode” capable of generating a first electric field in the sample chamber, and a “third electrode capable of generating a second electric field” in a fluid reservoir. The “first electric field is configured to transfer charged molecules in the sample chamber.” The standard for meeting § 112, second paragraph is “whether the claim apprises one of ordinary skill in the art of its scope . . . by providing clear warning to others as to what constitutes infringement of the patent.” *See, e.g., Solomon v. Kimberly-Clark Corp.*, 216 F.3d 1372, 1379 (Fed. Cir. 2000); MPEP § 2173.02. However, “[t]he purpose of claims is not to explain the technology or how it works, but to state the legal boundaries of the patent grant.” *S3 Inc. v. nVIDIA Corp.*, 259 F.3d 1364, 1369 (Fed. Cir. 2001).

As noted above, the claims recite a first electrode and a second electrode capable of generating a first electric field “configured to transfer charged molecules in the sample chamber,” and a third electrode that is capable of generating a second electric field in a fluid reservoir. The boundary of the claims can be easily ascertained by determining whether the first electric field “is configured to transfer charged molecules in the sample chamber.” There is no need to explain how the configuration works to transfer the charged molecules in

order to satisfy § 112, second paragraph. As long as the claims would be understood by one of ordinary skill in the art in light of the specification, the requirements of 35 U.S.C. § 112, second paragraph are met, and the claims are not indefinite.

Therefore, the claims particularly point out and distinctly claim the subject matter Applicants regard as invention, and the claims are not indefinite. Accordingly, it is respectfully requested that the Examiner withdraw the rejection of the claims under 35 U.S.C. § 112, second paragraph.

Claims 1-7, 9-10, and 13 were rejected under 35 U.S.C. §102(b), as allegedly being anticipated by U.S. Patent No. 6,214,191 (“Wiktorowicz”) for the reasons set forth on pages 4 and 5 of the Office Action.

In response, Applicants submit that the present invention, as recited in claim 1, is directed to an integrated microfluidic device comprising a sample chamber and a fluid reservoir connected by a micro-fluidic channel. The microfluidic channel comprises an inlet and an outlet, the sample chamber is positioned at the inlet of the microfluidic channel and comprises a first electrode and a second electrode, capable of generating a first electric field in the sample chamber, where the first electric field is configured to transfer charged molecules in the sample chamber to the inlet of the microfluidic channel, and the fluid reservoir is positioned at the outlet of the microfluidic channel, and comprises a third electrode capable of generating a second electric field with at least the second electrode.

As recited in claim 5, the present invention is directed to integrated microfluidic device comprising a sample chamber and a fluid reservoir connected by a micro-fluidic channel. The microfluidic channel comprises an inlet and an outlet, the sample chamber is positioned at the inlet of the microfluidic channel, and comprises a first electrode and a second electrode, capable of generating a first electric field in the sample chamber, and a section of matrix material comprising charged molecules. The first electric field is configured to electro-elute the charged molecules from the section of matrix material, and to transfer the charged molecules to the inlet of the microfluidic channel, where the fluid reservoir is positioned at the outlet of the microfluidic channel, and comprises a third electrode capable of generating a second electric field with at least the second electrode

Therefore, the microfluidic device of the invention has a first electrode and a second electrode capable of generating a first electric field in the sample chamber, and a third electrode capable of generating a second electric field in a fluid reservoir. Independent claims 1 and 5 recite that the sample chamber comprises two electrodes capable of generating an electric field in the sample chamber. The two electrodes 30a and 32a in Wiktorowicz, on

the other hand, are on two separate electrode loading ports **30** and **32**, and are not in the same sample chamber as recited in the pending claims. Therefore, Wiktorowicz does not anticipate the pending claims. Moreover, the optional third electrode **34a** is “**electrically separate** from the first and second electrodes” Wiktorowicz, Col. 5, lines 54-57 (emphasis added). Wiktorowicz does not have a “third electrode capable of generating a second electric field with at least the second electrode” as recited in the claims.

Therefore, as Wiktorowicz does not disclose the presently claimed invention, it does not anticipate claims 1-7, 9-10, and 13. Accordingly, Applicants respectfully request that the Examiner withdraw the rejection of claims 1-7, 9-10, and 13 under 35 U.S.C. § 102(b) over that reference.

Claims 5-7 were rejected under 35 U.S.C. §102(b), as allegedly being anticipated by Japanese Patent No. 05082178 (“Kanbara”) for the reasons set forth on page 5 of the Office Action.

In response, Applicants submit that the present invention is directed to a microfluidic device having a first electrode and a second electrode capable of generating a first electric field in the sample chamber, and a third electrode capable of generating a second electric field in a fluid reservoir. Independent claim 5 recites that the sample chamber comprises two electrodes. Figures 1 and 2 of Kanbara show that the electrophoretic device contains two sample chambers **21** and **22**, each with only one electrode **71** and **72**, respectively. The sample chambers in Kanbara are not connected such that electrodes **71** and **72** can be configured to generate an electric field with each other in the sample chamber.

Therefore, as Kanbara does not disclose the presently claimed invention, it does not anticipate claims 5-7. Accordingly, Applicants respectfully request that rejection of 5-7 claims under 35 U.S.C. § 102(e) over Kanbara be withdrawn.

Claims 15-19 were rejected under 35 U.S.C. §102(e), as allegedly being anticipated by U.S. Patent No. 6,361,671 (“Mathies”).

In response, Applicants submit that the present invention, as recited in claim 15, is directed to an integrated microfluidic device, comprising a sample chamber and a fluid reservoir connected by a micro-fluidic channel. The microfluidic channel comprises an inlet and an outlet, the sample chamber is positioned at the outlet of the microfluidic channel, and comprises a first electrode and a second electrode, capable of generating a first electric field in the sample chamber, wherein the electric field is configured to transfer charged molecules from the outlet of the microfluidic channel into the sample chamber, and the fluid reservoir is

positioned at the inlet of the microfluidic channel and comprises a third electrode capable of generating a second electric field with at least the second electrode.

In contrast, element 13 of Mathies is a detection reservoir, not a “sample chamber” as alleged in the Office Action. Mathies, Col. 6, line 39. Element 21, on the other hand, is the sample reservoir. *Id.* at Col. 7, line 15. The sample reservoir in Mathies does not contain any electrodes, much less two electrodes capable of generating an electric field in the sample chamber.

Therefore, as Mathies does not disclose the presently claimed invention, it does not anticipate claims 15-19. Accordingly, Applicants respectfully request that rejection of the claims 15-19 under 35 U.S.C. § 102(e) over Mathies be withdrawn.

Claims 8, 12, and 14 were rejected under 35 U.S.C. §103, as allegedly being unpatentable over Wiktorowicz in view of U.S. Patent No. 4,959,133 (“Adcock”) for the reasons set forth on pages 6 and 7 of the Office Action.

As discussed above, independent claims 1 and 5, which recite that the sample chamber comprises two electrodes capable of generating an electric field in the sample chamber, are patentable over Wiktorowicz. Adcock discloses a method of field inversion electric pulses to force DNA or protein out of a gel and into an appropriate receiver. However, Adcock does not disclose the microfluidic device recited in claims 1 or 5, and fails to remedy the deficiencies of Wiktorowicz described above. Even if the disclosures of Wiktorowicz and Adcock were combined, the resulting combination would not provide the presently claimed invention.

Therefore, as Wiktorowicz and Adcock, whether taken alone or in combination, do not disclose or suggest the presently claimed invention, the claims 14 are patentable over these references. Accordingly, Applicants respectfully request that rejection of claims 8, 12, and 14 under 35 U.S.C. § 103(a) over those references be withdrawn.

Applicants thus submit that the entire application is now in condition for allowance, an early notice of which would be appreciated. Should the Examiner not agree with Applicants’ position, a personal or telephonic interview is respectfully requested to discuss any remaining issues prior to the issuance of a further Office Action, and to expedite the allowance of the application.

No fee is believed to be due for the filing of this Amendment. Should any fees be due, however, please charge such fees to Deposit Account No. 11-0600.

Respectfully submitted,

KENYON & KENYON LLP

Dated: September 13, 2006

By: Alan P. Force

Alan P. Force

Reg. No. 39,673

One Broadway

New York, NY 10004

(212) 425-7200